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as rowers. At 16 miles inland from the fiord a heavy fall of snow stopped farther travel. After an absence of four days we returned to our boat, but found that the fall of snow, followed by unusually cold weather, had already caused the fiord to freeze up for many miles. We had enough of provisions, and were supplied with some excellent fresh mutton, milk, and butter by an Esquimaux that lived in the neighbourhood, to whose house we removed. The frost continued for several days with unusual severity, and made the ice strong enough to enable Captain Young (after coming half way up the fiord in a boat) to travel over the ice with a sledge party from the *Fox* to our relief. Another party of men, sent by Superintendent Möller from Julianshaab to aid us, arrived at the same time. We all returned next day (the 6th) to the *Fox*.

At Julianshaab, as at Fredrikshaab, nothing could exceed the kindness and hospitality of the resident Danish gentlemen. Mr. Möller, the superintendent, Mr. Höyer, his assistant, the doctor, and others vied with each other in paying us attention.

The chief exports of the place are whale and seal oil, fox skins (blue and white), bear skins, and eider down. A few cattle, goats, and sheep are kept. The hay is usually collected at the summer encamping places of the natives, and must be very nutritious, as I was informed that one small cow during the past summer had not only yielded sufficient milk and cream to supply the family, but also to make eighty Danish pounds of butter. The natives here, as at Fredrikshaab, are honest, docile, and well conducted, doing great credit to the Danish government. The prevailing form of worship is the Lutheran.

The result of this expedition, as far as regards the land portion of it over the Færöe Isles and Iceland, was extremely favourable to the practicability of laying down or erecting a telegraphic wire. The question in Iceland will be, whether the telegraph should be carried across the whole island from Beru Fiord to Faxe Bay, or only from Portland Bay to the latter place. The latter will reduce the distance on land from about 250 to 90 miles.

The fourth Paper read was—

4. *Fiords of South Greenland.* By J. W. TAYLER, Esq.

THE land of Greenland is very elevated, the average height of its mountains being not less, perhaps, than 1500 feet, and in some places exceeding 6000 feet, above the level of the sea. It appears that at the time of the elevation of the west coast of Greenland, a chain of mountains of about 50 miles in breadth, running about north and south, was acted on in a wave-like manner, *i. e.* leaving depressions nearly equal to the elevations, and more or less at right angles with the direction of the chain. These depressions or long valleys into which the sea runs constitute the fiords: they vary in breadth from 1 to 8 miles, and run up into the interior from 10 to 60 or more miles.

The scenery in these fiords is magnificent, perhaps unequalled. The lofty mountains—rugged, precipitous, and barren—with patches of ice (projections from the great interior glaciers), and snow unmelted by the summer's sun; with valleys half filled up by enormous angular blocks of stone detached from the sides of the steep mountains by the alternate frost and thaws; the solitude, and the almost total absence of life, animal and vegetable, make up a picture of indescribable desolation.

In other places the more rounded and sloping mountains are covered with green and yellow moss. Grass, heath, and wild flowers grow in the valleys; whilst in some still more favoured and sheltered dales, miniature forests of Arctic willow, six feet in height, are pointed out by the Esquimaux as proofs of the extraordinary excellence of the climate of Greenland and fertility of the soil. Of the latter material there is not, however, in many places sufficient to bury the dead, and they are compelled to place the body on the surface and form a grave by building up stones around it.

These fiords with grassy dales offer the most pleasant places of abode in Greenland; in fact, it is only to the more fertile parts of the fiords that the name of Greenland is at all appropriate. But these parts of the fiords form a striking contrast to the outer coast of Greenland.

The Danish settlements are mostly at the entrance of the fiords, for the convenience of seal-hunting and of shipping; but the old Scandinavians who settled in Greenland in the ninth century brought cattle with them, and therefore established themselves at the interior ends of the fiords and bays, where grass was to be found. The ruins of their habitations, constructed of very large blocks of stone, are still to be seen at all the more fertile places. Judging from the number of ruins and the accounts in the Icelandic Sagas, their number must at one time have reached about 10,000. But the Scandinavians of Greenland have perished; cattle no longer graze in the valleys as then; and some heaps of stones are all that remain to show the enterprise of those early western pioneers.

The Icelandic Sagas contain descriptions of most of the fiords of South Greenland and of the chief settlers in them. Perhaps the most notable in this respect is the fiord of Igalikko. This fiord ends in two forks or arms: in the northern stand the ruins of Brattelid, the first town in Greenland, built by the first settler, Eric the Red, in 986; in the other was built the town of Garde, the residence of the Bishop of Greenland. These two towns vied with each other in the claim for precedence—Brattelid claiming it on the ground of its being the first erected, and the residence of Eric the Red and his descendants; whilst Garde asserted its superior worthiness in being the residence of the bishop. After much wordy quarrelling and sundry duels, Garde appears to have triumphed, and was henceforth considered as the capital of Greenland.

But Garde now shares the ruin and desolation of Brattelid, with nothing else to recommend it to our further notice. Not so, however, with its rival Brattelid. In the time of Eric the Red, A.D. 1000, there sailed from the fiord of Igalikko and from the town of Brattelid an expedition of discovery. These enterprising Scandinavians were not contented with having discovered the vast territory of Greenland; this appears to have only stimulated their thirst for further discoveries, and it may perhaps also be that, after two or three years' residence in Greenland, they found it was not the El Dorado they had dreamed of; however, the expedition sailed to the west and south, and finally discovered the continent of America. They found good prairie land, which they called Markland, and sailing on they came to a land bearing wild grapes in great abundance: this they called Viinland. They wintered in America, left some settlers (who after some time succumbed to the natives), carved their runics on the rocks, and taking in cargoes of timber and supplies of wild grapes, sailed the next summer and safely returned to Brattelid.

Thus the credit of discovering America is certainly due to the Scandinavians of Greenland. And Columbus, when he visited Iceland some years previous to his celebrated voyage, no doubt read the accounts of the discovery in the Icelandic Sagas. But as these accounts were suffered to remain almost unknown to the world, and as the navigators of northern Europe had in his time forgotten the route discovered by their more energetic forefathers not only to America but also to Greenland (which was then called the "Lost Land"), all honour is certainly due to Columbus for the re-discovery of America.

When Eric the Red first settled in the fiord of Igalikko, the Christian religion had not reached Iceland or Norway. Thor with his hammer reigned supreme. But Thor and his worshippers have sunk into oblivion. bequeathing us his hammer, the symbol of industry. The fiords of Greenland are about to witness a new era of enterprise and engineering skill: ere long the North Atlantic Telegraph Cable will repose at the bottom of one of its fiords, again uniting with Europe the countries of Iceland, Greenland, and America.

In the neighbourhood of high land the water is generally of great depth, and the fiords of Greenland form no exception to the rule; in fact, it is only near the lower and more sloping land that vessels can lie at anchor, and this only in small coves so near to the land that it is the general practice to make fast to the shore by hawsers. Outside of this the water deepens rapidly, and in the middle of many of the fiords there is some 500 fathoms water. I should say that of the deeper fiords 300 fathoms will be found to be the average depth. In some places, where the rocks are nearly perpendicular, a fishing-line of 100 fathoms fails to reach the bottom within a few yards of the shore.

Looking at the map of Julianshaab district, you will see that some of the fiords terminate at the continental ice, whilst others do not reach it; the former fiords have glaciers, the latter have not.

These glaciers are the outlets of the continental ice, which has a motion from the interior towards the sea coasts; and as the deep valleys or fiords are the only outlets, the ice is forced into them until, by projecting from the land into the sea, or fiord, portions give way and break off, owing to not being sufficiently supported by being adequately immersed, or owing to the rifts and chasms which exist in the glacier. The larger of these portions, when thus detached from the glacier, constitute icebergs.

The glaciers in the fiords of the southern parts of the west coast of Greenland are not very large, and consequently their icebergs are never of great dimensions. I do not think any iceberg produced by the glaciers of the fiords within 100 miles north or south of Julianshaab would ground in 60 fathoms.

The glaciers bring down with them boulders, sand, and much fine clay, the result of attrition; the boulders are always rounded, owing to the severe abrasion they have undergone by being transported over the rocks below, whilst under the enormous pressure of the vast thickness of continental ice. This glacial clay floats suspended in the water, several miles from the glacier, rendering it turbid or milky, and depositing itself gradually throughout the whole length of the fiord. So vast has been the quantity, and so long the period of time during which this transport of clay has proceeded, that some fiords have been so completely filled up by it that they are only navigable in boats of light draught and at high water.

From this choking up of the fiord the glacier has ended in being unable to longer launch its icebergs; it has, therefore, found a new outlet through some other valley, where it will repeat the process of gradually filling up the fiord.

As nearly all the fiords have, or have had, glaciers in them bringing down the clayey deposits I have mentioned, the bottom must be of soft material. If the cable be taken into a fiord having a glacier, I think the clay which will be gradually deposited over it will be of great service in protecting it from injury by marine animals or other damaging agents.

The existence of these fiords is extremely advantageous to the carrying of the telegraph cable to Greenland, and there bringing it on shore. Were it not for these, some difficulties might have been met with in finding a suitable place for the landing, owing to the ice-streams on the outside coast; but in several of these fiords, Tessermiut, for example, the water is of such depth as to preclude the possibility of icebergs grounding upon the cable, and the almost perpendicular mountains forming parts of the lateral coasts of the fiords, and the deep water at their bases, offer excellent situations for leading up the cable from the middle of the fiord to the shore, without exposing it in the slightest degree to the grounding of icebergs upon it.

In conclusion, I beg to state, that from the results of seven years' observation in Greenland, I am of opinion that neither the ice nor the configuration of the coast will offer any impediment to the successful laying and landing of the telegraph cable in Greenland.

The fifth Paper read was—

5. *Electric Circuits.* By Colonel T. P. SHAFFNER, of the U. S., F.R.G.S., &c.

LANDING PLACES AND LENGTHS OF CIRCUITS.

Scotland to Færöe Isles.—One end of the cable for this section will be landed in one of the many safe bays in North Scotland—the precise place has not been determined. The other end it is proposed to land in a beautiful bay near Thorshaven. This section will be some 225 miles, and the depth of the sea not exceeding 254 fathoms; bottom, mud and shells.

Færöes to Iceland.—One end of the cable will probably be landed at Haldervig, near the north of Stromöe Isle. Captain Young